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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,099	01/16/2004	Paul Marcius Butterfield	117435	4975

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EXAMINER	
ZHU, RICHARD Z	

ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
10/20/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/758,099	BUTTERFIELD ET AL.	
	Examiner	Art Unit	
	RICHARD Z. ZHU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/19/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Acknowledgement

1. Acknowledgement is made of applicant's amendment made on 08/12/2008. Applicant's submission filed has been entered and made of record.

Status of the Claims

2. Claims 1-20 are pending. Claims 1, 8, 17, and 20 are "currently amended".

Response to Applicant's Arguments

3. Applicant amended the claim to require determination of color misregistration on the basis of color shift represented by ΔE color difference. This is defined in the specification as color difference requiring analysis and calculation in CIE-LAB color space, which is different from the color shift of ***Decker***. Therefore, the scope of color shift is now limited to what is defined in the specification. In view of this amendment, rejections set forth in the previous office action are withdrawn. In view of a new reference "***Klassen***" upon further consideration, new grounds of rejections are enter in this office action.
4. Whether or not the densitometer of ***Decker*** precludes ***Decker*** from being modified in the context of the invention is up for debate. However, the relevant teachings of printing registration patterns and patches in ***Decker*** can still be use as a secondary teaching for modifying a primary reference because at least said relevant teachings of the disclosure has nothing to do with any limitations inherent in a densitometer. That is, given the color scanner of ***Klassen***, the new primary reference can be modify by ***Decker*** because the invention of

Klassen can still be printed as registration patterns on registration patches without any teaching directly suggest against it. Therefore, it is proper to modify ***Klassen*** with ***Decker***.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-9 and 14-20 are rejected under 35 USC 103 (a) as being unpatentable over ***Klassen (US 6345117 B2)*** in view of ***Decker (US 6198549 B1)*** and ***Castelli et al. (US 5748221 A)***.

Regarding Claim 1, ***Klassen*** discloses a method for detecting color misregistration in an image forming system comprising (**Abstract, detecting and trapping color misregistration and see Fig 3**):

forming a registration image with the image forming system (**Col 10, Rows 42-62, forming a digital representation of a scanned input image**);

calculating or selecting a combined color value (**Col 11-12, Table 1, in particular, the Boolean combination of cyan and magenta "1100", "1101", "1110" and "1111"**);

performing spectrophotometric analysis on the registration patch to detect a detected color value (**Col 10, Rows 41-48, common color scanner 10, see Fig 3 for detecting input colors a and b, see Col 11, Rows 40-50**);

determining if color misregistration has occurred (**Col 14, Rows 1-14, comparing the maximum of a visibility vector with a threshold to determine whether**

misregistration occurs) by comparing the detected color value with the combined color value (**Col 13, Row 66- Col 14, Row 2, said visibility vector is constructed from the two colors a and b and the list of misregistration colors or combined color value shown in Table 1. That is, the ΔE that representing the difference or comparison between actual input colors (a, b) and list of misregistration colors being used to construct the visibility vector that is used to determine whether or not misregistration is visible**); and

obtaining a degree of color misregistration based on an amount of color shift between the detected color value and the combined color value that is represented by a ΔE color difference between the detected color value and the combined color value (**Col 13, Rows 1-45, as best understood by the examiner, ΔE, be it standard CIE76, CIE94, or S-CIELab, is used to determine whether misregistration is visible, see Col 13, Rows 8-15 and it appears to play a part in deriving the visibility function made from input colors a and b and the list of misregistration colors shown in Table 1. The degree of misregistration is determined by comparing this derived visibility function to a threshold**);

Klassen does not disclose forming a registration patch with the image forming system and obtaining a degree of color misregistration based on known dimensions of the registration patch.

Decker discloses a method for detecting color misregistration in an image forming system (**Abstract**) comprising:

forming a registration pattern with the image forming system (**Fig 2 and see Col 4, Rows 31-34**);

performing spectrophotometric analysis on the registration patch to detect a detected color value (**Co 8, Rows 20-30, using a densitometer to perform spectrophotometric analysis**).

determining if color misregistration has occurred (**Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the amount of color misregistration – C1 * (Density Difference)**);

obtaining a degree of color misregistration based on known dimensions of the registration pattern (**Col 5, Rows 20-40**).

Castelli discloses a method or detecting color misregistration in an image forming system (**Col 3, Rows 24-30**) comprising forming a registration patch with registration pattern thereon using the image forming system (**Col 6, Rows 65-67**).

Decker suggested that the dimension of a registration pattern must be such that it is large enough for a spectrophotometer such as a colorimeter of ***Castelli*** or color scanner of ***Klassen*** to have an accurate assessment of the average overall misregistration and small enough for said spectrophotometer's aperture, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the input image of ***Klassen*** to be printed as registration pattern taught by ***Decker*** on a registration patch taught by ***Castelli*** with a specified dimension large enough to give an accurate assessment of overall misregistration but small enough to fit the aperture of color scanner whereas the motivation would've been to avoid any inaccuracies due to the placement of the aperture of the color scanner within a repetitive pattern and to avoid inaccuracies due to density variations caused by variations in the paper velocity though a print station (***Decker*****, Col 5, Rows 40-45**).

Regarding Claim 2, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses the step of forming a registration patch further comprising steps of:

forming the registration patch in a combination of colors having a composite color value equivalent to the calculated or selected value (***Decker,* Col 4, Rows 30-60 and see Col 8, Rows 19-21, colors comprising Cyan, Magenta, Yellow, and Black**).

Regarding Claim 3, ***Klassen*** discloses the method for detecting color misregistration further comprising generating an output signal in response to determining if color misregistration has occurred **(Col 14, Rows 1-14, if the maximum of the visibility function is greater than a predetermined threshold, an output signal indicating visible misregistration is outputted so that a color can be determined and selected for trapping**).

Regarding Claim 4, ***Klassen*** discloses that the output signal indicates whether the image forming system is performing within satisfactory limits **(Col 14, Rows 1-14, if the maximum of the visibility function is less than a predetermined threshold, it is determined that misregistration is not visible and the system is performing satisfactorily**).

Regarding Claims 5, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:

scanning the registration patch with a spectrophotometric device (***Klassen,* Col 10, Rows 42-62, color scanner 10, *Decker,* Col 8, Rows 24-25, using a densitometer. Said color scanner is modified to scan repetitive patterns**).

Regarding Claims 6, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses wherein the forming a registration patch comprises forming a registration patch which has at least two superimposed colors formed in a line perpendicular to a direction of color misregistration (***Decker,* Fig 2A-B and see Col 4, Rows 52-67**).

Regarding Claim 7, ***Klassen*** discloses the method for detecting color misregistration further comprising performing an adjustment operation if it is determined that an unacceptable level of color misregistration has occurred (**Col 14, Rows 15-50, see also Col 2, Rows 16-25, using color trapping to correct misregistration**).

Regarding Claim 8, ***Klassen*** discloses an image forming system capable of detecting and adjusting for color misregistration (**Fig 3**) comprising:

a spectrophotometric device either attached to or integral to the image forming system (**Col 10, Rows 41-48, common color scanner 10, see Fig 3**);

a controller that causes the spectrophotometric device to perform detection of color misregistration (**Fig 3, Image Processing Unit 16 as a software in a digital computer realized as either software embodied in a computer hard drive to be executed by CPU or hardware logic circuitry, see Col 18, Rows 20-35**) base on at least an amount of color shift that is represented by a AE color difference, on at least one registration image by comparing a detected color value of the registration patch that is detected by the spectrophotometric device to a combined color value of the registration patch that is calculated or selected (**Col 13, Rows 1-45, as best understood by the examiner, ΔE, be it standard CIE76, CIE94, or S-CIELab, is used to determine whether misregistration is**

visible, see Col 13, Rows 8-15 and it appears to play a part in deriving the visibility function made from input colors a and b and the list of misregistration colors shown in Table 1. The degree of misregistration is determined by comparing this derived visibility function to a threshold).

Klassen does not disclose performing detection of color misregistration based on known dimensions of a registration pattern.

Decker discloses a method for detecting color misregistration in an image forming system (**Abstract**) comprising:

forming a registration pattern with the image forming system (**Fig 2 and see Col 4, Rows 31-34**);

performing spectrophotometric analysis on the registration patch to detect a detected color value (**Co 8, Rows 20-30, using a densitometer to perform spectrophotometric analysis**).

determining if color misregistration has occurred (**Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the amount of color misregistration – C1 * (Density Difference)**);

obtaining a degree of color misregistration based on known dimensions of the registration pattern (**Col 5, Rows 20-40**).

Decker suggested that the dimension of a registration pattern must be such that it is large enough for a spectrophotometer such as a color scanner of ***Klassen*** to have an accurate assessment of the average overall misregistration and small enough for said spectrophotometer's aperture, it would've been obvious to one of ordinary skill in the art at

the time of the invention to modify the input image of ***Klassen*** to be printed as registration pattern taught by ***Decker*** with a specified dimension large enough to give an accurate assessment of overall misregistration but small enough to fit the aperture of color scanner whereas the motivation would've been to avoid any inaccuracies due to the placement of the aperture of the color scanner within a repetitive pattern and to avoid inaccuracies due to density variations caused by variations in the paper velocity though a print station (***Decker*, Col 5, Rows 40-45**).

The combined teachings do not disclose a plurality of image forming stations, each image forming station forming an image in one color and a charge retentive surface which receives each image from its corresponding image forming station and transfers the combined image to a recording medium.

Castelli discloses an image forming system capable of detecting and adjusting for color misregistration comprising:

a plurality of image forming stations, each image forming station forming an image in one color (***Castelli,* Fig 6, Development Stations C and D**);

a charge retentive surface which receives each image from its corresponding image forming station and transfers the combined image to a recording medium (***Castelli,* Fig. 6, belt 10, and see Col 4, Rows 25-30**);

a spectrophotometric device either attached to or integral to the image forming system (***Castelli,* Col 6, Rows 61-64, spectrophotometer connected via neural networks and Col**

6, Rows 9-16, the main sensor of the invention is integral to the image forming system); and

a controller that causes the spectrophotometric device to perform detection of color misregistration on at least one registration patch (***Castelli,* Fig. 7, Controller**).

Decker suggested in its background arts that it is well known to form test patterns on patches (**Col 1, Rows 14-28**). Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the input image of ***Klassen*** to be printed as registration pattern taught by ***Decker*** on a registration patch taught by ***Castelli*** so as to correctly measure the optical densities of said registration patterns *(**Decker,** **Col 1, Rows 14-28**)*.

Regarding Claim 9, ***Klassen*** discloses the controller further implements an adjustment to reduce detected misregistration (**Col 14, Rows 36-50, determining out a plurality of candidates, who best implements an adjustment to make misregistration invisible**).

Regarding Claim 14, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses the registration patch is formed in a combination of colors having a composite color value equivalent to the combined color value (***Klassen,* Col 13, Row 66 – Col 14, Row 14, the colors comprising any combination of two colors a and b involves a combination of C, M, Y, and K, see Col 14, Rows 20-35**).

Regarding Claims 15 and 16, ***Klassen*** discloses the controller further implements an output signal which indicates the results of the detection of the color misregistration (**Col 14,**

Rows 1-14, if the maximum of the visibility function is greater than a predetermined threshold, an output signal indicating visible misregistration is outputted so that a color can be determined and selected for trapping) and output signal indicates whether the image forming system is performing within satisfactory limits **(Col 14, Rows 1-14, if the maximum of the visibility function is less than a predetermined threshold, it is determined that misregistration is not visible and the system is performing satisfactorily)**.

Regarding Claim 17, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses the method for detecting color misregistration, performing spectrophotometric analysis and the spectrophotometric analysis further comprising:

scanning the registration patch with a spectrophotometric device **(*Klassen,* Col 10, Rows 42-62, color scanner 10. See also *Decker,* Col 8, Rows 24-25, using a densitometer)**;

and obtaining a degree of color misregistration based on an amount of color shift between the color detected by the spectrophotometric device and the calculated or selected color value **(*Klassen,* Col 13, Rows 1-45, as best understood by the examiner, ΔE, be it standard CIE76, CIE94, or S-CIELab, is used to determine whether misregistration is visible, see Col 13, Rows 8-15 and it appears to play a part in deriving the visibility function made from input colors a and b and the list of misregistration colors shown in Table 1. The degree of misregistration is determined by comparing this derived visibility function to a threshold)**.

Regarding Claims 18, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses wherein the forming a registration patch comprises forming a registration patch which has at least two superimposed colors formed in a line perpendicular to a direction of color misregistration (***Decker,* Fig 2A-B and see Col 4, Rows 52-67**).

Regarding Claim 19, ***Klassen*** as modified by ***Decker*** and ***Castelli*** discloses at least one adjustment operation wherein the adjustment operation is able to alter an image forming process of at least one of the plurality of image forming stations if a spectrophotometric analysis indicates color misregistration has occurred (***Klassen,* Col 14, Rows 15-50, see also Col 2, Rows 16-25, using color trapping as adjustment operation to correct misregistration**).

Regarding Claim 20, ***Klassen*** discloses an apparatus comprising:

means for forming image digitally (**Col 10, Rows 42-62**);

means for performing spectrophotometric analysis on the at least one registration image to detect a detected color value (**Fig 3, Image Processing Unit 16 as a software in a digital computer + Color Scanner 110**);

means for determining if color misregistration has occurred based on the spectrophotometric analysis of the registration image (**Fig 3, Image Processing Unit 16 and see Col 13, Row 66 – Col 14, Row 14**);

means for adjusting the image forming process to adjust for the color misregistration (**Fig 3, Image Processing Unit 16 as a software in a digital computer + Trapping Processor 18**);

means for obtaining a degree of color misregistration based on at least an amount of color shift that is represented by a AE color difference, on at least one registration image by comparing a detected color value of the registration patch that is detected by the spectrophotometric device to a combined color value of the registration patch that is calculated or selected (**Col 13, Rows 1-45, as best understood by the examiner, ΔE, be it standard CIE76, CIE94, or S-CIELab, is used to determine whether misregistration is visible, see Col 13, Rows 8-15 and it appears to play a part in deriving the visibility function made from input colors a and b and the list of misregistration colors shown in Table 1. The degree of misregistration is determined by comparing this derived visibility function to a threshold**).

Klassen does not disclose performing detection of color misregistration based on known dimensions of a registration pattern.

Decker discloses a method for detecting color misregistration in an image forming system (**Abstract**) comprising:

means for forming a registration pattern with the image forming system (**Fig 2 and see Col 4, Rows 31-34**);

means for performing spectrophotometric analysis on the registration patch to detect a detected color value (**Co 8, Rows 20-30, using a densitometer to perform spectrophotometric analysis**).

means for determining if color misregistration has occurred (**Col 5, Row 62- Col 6, Row 8, Col 7, Rows 5-15, and see Col 8, Rows 20-67, the amount of color misregistration – C1 * (Density Difference)**);

means for obtaining a degree of color misregistration based on known dimensions of the registration pattern **(Col 5, Rows 20-40)**.

Decker suggested that the dimension of a registration pattern must be such that it is large enough for a spectrophotometer such as a color scanner of ***Klassen*** to have an accurate assessment of the average overall misregistration and small enough for said spectrophotometer's aperture, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the input image of ***Klassen*** to be printed as registration pattern taught by ***Decker*** with a specified dimension large enough to give an accurate assessment of overall misregistration but small enough to fit the aperture of color scanner whereas the motivation would've been to avoid any inaccuracies due to the placement of the aperture of the color scanner within a repetitive pattern and to avoid inaccuracies due to density variations caused by variations in the paper velocity though a print station (***Decker*, Col 5, Rows 40-45**).

The combined teachings do not disclose means for forming images by creating at least one registration pattern on a patch.

Castelli discloses an apparatus for detecting color misregistration comprising:

means for forming images **(Col 4, Rows 5-7, an imaging system)**;

means for creating at least one registration patch **(Col 6, Rows 65-67, a number of patches)** having a combined color value **(Col 6, Row 67 – Col 7, Row 2, colors are selected to adequately represent the printer's collection of colors, a combination of RGB or CMYK)**;

Decker suggested in its background arts that it is well known to form test patterns on patches (**Col 1, Rows 14-28**). Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to modify the input image of ***Klassen*** to be printed as registration pattern taught by ***Decker*** on a registration patch taught by ***Castelli*** so as to correctly measure the optical densities of said registration patterns ***(Decker,* Col 1, Rows 14-28**).

7. Claims 10-13 are rejected under 35 USC 103 (a) as being unpatentable over the combined teachings of ***Klassen (US 6345117 B2)*** in view of ***Decker (US 6198549 B1)*** and ***Castelli et al. (US 5748221 A)*** further in view of what is well known.

Regarding Claims 10-13, the combined teachings do not explicitly disclose that the printing machine is a digital photocopier, an ink jet printer, or a laser printer.

Nonetheless, the cited printing machines are well known species of genus printing machines and it is well within the knowledge of one ordinarily skilled in the art to use the above-mentioned copiers and printers as the image forming system because each of said copiers and printers are qualified to perform superbly in the endeavor of color printing and they are all very well known under the sun (**Official Notice**).

It would've been obvious to one ordinarily skilled in the art at the time of invention to use either a digital photocopier, an ink jet printer, a laser printer, a facsimile machine, or a combination facsimile machine and printer machine as the printing machine of the combined teachings in order to enable the printing of multi-color images from which spectrophotometric analysis can be performed.

Conclusion

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 6:30 - 5:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

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RZ[2]
10/08/2008

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